

## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



1  
AG 842

# ING WATER TO SHEEP

on Western Ranges



Leaflet No. 423

U. S. Department of Agriculture

# HAULING WATER TO SHEEP ON WESTERN RANGES

By Selar S. Hutchings

*Intermountain Forest and Range Experiment Station, Forest Service*

Hauling water to sheep on western ranges, wherever stock watering places are few and far between, can increase the owner's income. Sheep that get enough water to drink every day without trailing long distances for it are healthier and show greater weight gains than sheep that go thirsty. Lamb crops too are higher. Water hauling also permits better grazing management and more efficient use of range forage.

Water at frequent intervals is one of the most important needs in raising livestock on western ranges. Scarcity of water becomes critical in drought years, but even in good rainfall years it is an ever-present problem on many ranges.

Permanent watering places such as springs, seeps, and wells often are too widely separated to permit efficient use of the forage. This situation is common on native and seeded ranges with ample forage, as well as ranges with sparse vegetation in the low rainfall areas. Sheep are often trailed long distances to permanent water. Forage plants on a large area around the watering place are overgrazed or entirely destroyed (fig. 1). At the same time the forage on areas a few miles away may be only lightly used.

Many reservoirs for catching and storing runoff have been built in recent years, often at great expense. In years of good rainfall most of them receive water, and these additional



F-472903

Figure 1.—Several flocks of sheep are trailed long distances to this central well. Vegetation on a large surrounding area is trampled out. This practice is hard on both the sheep and the range.



watering places make it possible to distribute the sheep better. But in average years only 50 to 60 percent of the reservoirs may be filled, and in dry years few if any receive water.

When it is available, the water in many of the reservoirs becomes dirty, brackish, and unpalatable, and sheep do not drink enough to satisfy their needs fully. Surrounding ranges, like those near springs and wells, are commonly grazed too heavily.

When snow is not available on the arid winter ranges of the West, especially in Utah, Wyoming, Nevada, and southern Idaho, supplemental water is a necessity for good grazing management. If the lower ranges lack snow, sheep are often trailed 3 to 5 miles to permanent springs, or to higher ranges where snowbanks lie on the north slopes (fig. 2).

After several such trips the forage along the way is exhausted and the distance between forage and water becomes too great to travel every day. Then the sheep are watered only every 2 or 3 days. Under this treatment they become extremely thirsty and the dry forage becomes unpalatable to them. Sheep will not

eat their daily fill unless they get enough water to drink. Lack of sufficient water undoubtedly contributes to malnutrition of sheep on the winter range.

To improve use of the forage and to eliminate excessive trailing, water hauling to range livestock was started at the Forest Service's Desert Experimental Range near Milford, Utah, in 1935. At first sheepmen in the adjacent valleys were not convinced that water hauling was feasible or practical. It has been so successful, however, that many of them now haul water to their flocks, not only on winter range, but during dry periods on spring-fall and summer ranges. Water from wells, springs, or streams is trucked to points remote from permanent water. Thus all range areas can be utilized, and undesirable concentration around permanent watering places can be avoided.

## Amount of Water Needed

Range flocks need considerable quantities of water. The amount depends on weather, temperature, forage, and season of the year.



F-410112

Figure 2.—Sheep trailed several miles from valley ranges get water at snowbanks in the mountains. Under this practice vegetation along driveways is destroyed, and sheep seldom get enough water.

On foothill areas in the Inter-mountain region used for range lambing in the spring when forage is green, sheep drink approximately one-half gallon per head per day.

On summer range 1 gallon per day is usually enough for a ewe and lamb; but where green, succulent forage is available and morning dews occur frequently, sheep require very little water.

During the fall when the lambs are about grown, they drink almost as much water as the ewes, and if the feed is dry and the weather warm, lambs as well as ewes drink more than a gallon per head per day.

Throughout most of the winter sheep drink about three-fourths of a gallon per head daily. If the weather is cool and the dry desert forage is moistened by rain or melting snow, sheep drink very little. Where snow is available on the range they seldom require any supplemental water.

In late winter when no snow is available and sheep are confined to dry grass or to areas of shadscale, winterfat, or saltbush they frequently drink 1.8 to 2.5 gallons a day per head, especially if the weather is warm.

A common opinion is that sheep require more water if they drink every day than if they are watered every other day. This is not true. In two winter seasons at the Desert Experimental Range, sheep that had access to water every day during late winter drank approximately 10 percent less water than those which received water every other day. Apparently sheep "overdrink" when they become extremely thirsty (fig. 3). Forced to go 2 or 3 days without water, sheep may drink 2 to 3 gallons of water, and the poorest and weakest ones often become "waterlogged," having drunk more than they can carry.

### Method of Watering

Best results are obtained if water is hauled to the sheep every day and troughs are moved to a new location after each watering. In this way sheep are kept on fresh feed most of the time, and trailing or excessive movement of animals over the range is largely eliminated.

Troughs should be set on firm or gravelly soil to lessen trampling damage. They should be spaced 20 to 30



F-440847

Figure 3.—Sheep arrive at permanent well and troughs dry-throated after 2 or 3 days without water. They crowd and jam against the troughs and many "overdrink." Here a herder patrols to prevent drowning of sheep pushed into the trough.



F-482375

**Figure 4.—Water trucked and put in troughs ahead of the flock. Sheep graze quietly to water, drink, and move on to fresh feed in a short time. Spacing troughs avoids crowding and trampling.**

feet apart to allow the sheep ample room to reach water and move away afterward without crowding (fig. 4). Daily routes of grazing should be planned and troughs placed ahead of the flock so that the sheep can graze quietly to water, drink, and move out onto fresh feed with a minimum of disturbance.

Sometimes troughs are not moved and sheep are watered again and again in the same place. This is not a good practice because the surrounding range soon becomes heavily grazed and trampled, and the vegetation near the troughs is killed. After a few waterings, sheep are forced to travel increasing distances between feed and water, trailing over range that has been fully grazed. Thus many of the benefits that can be gained from water hauling are lost.

During cold winter weather, water should be hauled and placed in the troughs just before it is to be used; otherwise it freezes, and large amounts are lost when the ice is removed. Besides, the water becomes so cold that the sheep will not drink enough to quench their thirst.

Trough storage and truck capacity should be adequate to care for the entire flock. If the water available in troughs and on the truck is insufficient to supply them all, it becomes necessary to haul extra loads for the remaining sheep. During the delay the sheep are restless and cause excessive damage to the vegetation by trampling.

Less trough space and storage capacity are required if sheep are watered daily than if they are watered at 2- or 3-day intervals. For example, on winter range about 2,000 gallons of water per day is usually sufficient for a band of 2,000 to 3,000 ewes. To furnish this amount of water requires 1,000- to 1,200-gallon trough capacity, or 10 to 12 troughs of 100-gallon capacity, plus a truckload of 1,000 to 1,200 gallons. However, if this same band is watered every other day they will drink about 4,000 gallons at each watering. This requires a truckload of 1,000 to 1,200 gallons and trough storage of approximately 3,000 gallons, or thirty 100-gallon troughs.

On summer range where flocks contain only 800 to 1,000 head, less trough



space is needed, of course, than on winter range with flocks of 2,000 to 3,000.

During the lambing period ewes need a special supply of water nearby to keep them from leaving their lambs. As lambs are dropped on the range, ewes and newborn lambs are left in small bands of 80 to 150 head for a few days. During this period one or two troughs should be placed near each band so that the ewes can reach water without leaving the lambing ground. After the lambs are 3 or 4 days old the sheep are gathered into larger bands and can be moved short distances and watered together.

## Equipment

*Troughs.*—The type of trough shown in figure 5 has proved very satisfactory for watering sheep. It is 1 foot deep, 2 feet wide, and  $7\frac{3}{4}$  feet long at the base. The ends and sides slope to a top measurement of  $2\frac{1}{4}$  feet wide by 8 feet long. The metal is 18-gage galvanized iron, rimmed at the top with 1-inch angle iron. Seams and corners are reinforced for greater strength.

Such troughs are easily handled, nest compactly for hauling, and are wide enough so that sheep can drink on both sides. Troughs should be kept in good repair, and handled carefully to avoid breakage and leaks.

*Truck.*—A heavy-duty, long-wheel-base truck with a nominal rating of  $1\frac{1}{2}$  to 2 tons, equipped with heavy-duty oversize tires, has been found suitable for water hauling (fig. 5). If loaded within their rated capacity, such trucks handle the load well. They can be used also to haul feed, livestock, and wool, and in many cases serve as all-purpose trucks around the headquarters ranches during other periods of the year.

*Tanks.*—Tanks in which to haul water should be sturdily constructed and equipped with valves and hoses for drainage.

Cylindrical tanks with a capacity of 500 to 600 gallons are well adapted for use on the truck (fig. 5). These are approximately  $3\frac{1}{2}$  feet in diameter and 6 or 7 feet long, and can easily lie crossways on a  $1\frac{1}{2}$ - or 2-ton truck. With this arrangement of short tanks, the end thrusts that result from movement of the water are minimized. Two



Figure 5.—Two tanks of 500- to 600-gallon capacity fit easily on a  $1\frac{1}{2}$ -ton heavy-duty truck. Portable troughs, nested, are conveniently loaded behind the tanks.



tanks make a convenient load for such a heavy-duty truck.

Galvanized tanks are more durable than ungalvanized ones, and if handled carefully will last indefinitely. The tanks should be made of  $\frac{1}{8}$ -inch steel plate. They should be mounted on iron skids. A  $2\frac{1}{2}$ -inch hole, with a lid, on top and a 2-inch pipe at the bottom at one end are suitable for filling and draining.

Such tanks are relatively light and can be loaded and unloaded easily. Tanks should be securely fastened to the truck bed or chassis to prevent creep and vibration, and located so that when filled the load is balanced. Loose, empty tanks dance along the truck bed and the vibration soon cracks the seams.

Sometimes a single large cylindrical tank of 1,000- to 1,500-gallon capacity is used to haul water. If so, it is usually mounted permanently on the truck frame instead of the truck bed. This lowers the center of gravity slightly, and a tank so mounted has less tendency to overturn the truck, especially on a side slope. But unless the tank has effective baffle plates inside, the water surging forward and backward causes severe end thrust, especially when less than a full load is hauled.

*Portable loading pump.*—A small portable pump greatly facilitates loading water into tanks from roadside streams, ponds, or reservoirs. A pump that will deliver 50 or more gallons per minute will fill the tanks quickly and expedite the watering job. It can be driven by a water-cooled,  $1\frac{1}{2}$ -horsepower gasoline engine. A self-priming pump with  $1\frac{1}{2}$ - to 2-inch openings for water intake and discharge is desirable.

Pumps should be drained during cold weather to prevent damage from freezing. Only sand-free water should be pumped. Screen the suction hose to prevent entrance of gravel or debris, which would damage or clog the pump.

*Storage tank.*—At a pumped well, or where the flow of water is small, a

storage tank and water-loading facilities are needed. A 10- to 15-gallon storage capacity at the well or reservoir for each sheep will serve the needs of the flock for 15 to 20 days. Also it will provide a reserve supply for use during emergency periods when equipment is being repaired.

Water loading can be accomplished easily if the storage tank is constructed on high ground, with a pipeline installed so that the water will flow into the truck by gravity. Pipe and hose should be 2 to 3 inches in diameter and be equipped with good valves so that loading can be accomplished quickly and easily, without loss of water.

## Costs of Hauling Water

Costs of hauling water vary widely, depending on distance hauled, condition of roads, road gradient, loading facilities, condition of equipment, amount of water required for the sheep, and weather conditions. Under average conditions it will cost approximately \$4 per day to haul water 10 miles to 1,000 sheep on summer range, and from \$8 to \$12 per day for a flock of 2,500 sheep on winter range. This averages about 10 to 15 cents monthly per sheep.

Outfits that hire a herder and a camp tender for each camp need not hire additional help, because the camp tender can haul the water if the distance does not exceed 10 to 15 miles, water is easy to get, and loading facilities are good. Most of the expense is for operation and maintenance of equipment. Outfits that have only one man for each flock need to hire additional help for water hauling, or to contract the job, which would increase costs somewhat.

## Benefits

When water is provided to all parts of the range, the entire area can be uniformly and properly grazed, concentration around watering places is avoided or greatly reduced, and long trails to and from water are not

necessary. Furthermore, by avoiding long trails through overused or deteriorated range, the danger of sheep eating poisonous plants such as halogeton is much reduced.

Sheep that receive ample fresh water every day fill up, graze a greater variety of forage, especially the drier forage, and utilize the various species more uniformly than sheep that are allowed to become extremely thirsty. Consequently, they are more likely to remain in thrifty condition.

For example, during a 40-day grazing period at the Desert Experimental Range in January and February, sheep supplied with water every day gained 3.4 pounds per head; those receiving water every second day gained 0.8 pound; and those watered only every third day lost 6.0 pounds per head. All sheep had equal access to ample feed. Water was hauled to the areas being grazed, so the sheep did not have to trail to water.

In another test a flock of sheep given water every day while on good feed remained in good condition, but the same flock lost 11 pounds per head in 10 days when placed on heavily grazed range and forced to trail 2 or more miles to snow.

When water is hauled to the drop bands during the lambing period, ewes graze quietly and remain with their lambs instead of abandoning them to find water. Thus more lambs are saved.

Since 1942, a range user on the Dixie National Forest in southern Utah has been hauling water during the summer to two bands of approximately 800 sheep each. The range grazed by the sheep is in the ponderosa pine type. It is fairly level and has a good network of roads, so that all parts of the range can be reached by truck.

The range user hauled water an average of 5 miles each day to the sheep. Prior to 1942 lamb crops averaged 80 percent, and in the fall they weighed 60 pounds per head. Since 1942, with little change in operation except water hauling, the lamb crops have averaged 110 percent, and fall weights have averaged 72 pounds. Water hauling has become an important part of livestock management on this range, and the range user is thoroughly convinced it has paid dividends.

Issued January 1958